REMARKS

The Office Action dated 4 March 2002 has been fully considered. Claims 1-49 are pending in this application, of which claim 47 has been amended. Reconsideration of the claims is respectfully requested.

In paragraph 3 on page 2 of the Office Action, claims 1-11 and 36-49 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent 5,854,757 issued to Dierke.

Applicants respectfully traverse the rejection for the following reasons.

Applicants' claimed invention sets forth, among other steps, a method for generating discrete cosine transforms. The method includes arranging discrete cosine transform equations (e.g. Equation 1) into at least one collection having at least two discrete cosine transform constants (e.g. C1, C3, C5, and C7). The method further comprises scaling the discrete cosine transform equations in the at least one collection by dividing each of the discrete cosine transform constants in the collection by one of the discrete cosine transform constants (e.g. C5 in Equation 2) from the at least one collection and representing each of the scaled discrete cosine transform constants with estimated scaled discrete cosine transform constants approximated by sums of powers-of-2.

In general, Applicants claimed invention at least allows faster discrete cosine transforms to be performed by scaling a collection of coefficients by one of the coefficients in the collection and further by representing the coefficients as estimates of the coefficients that can be represented by sums of powers-of-2.

Dierke is different from Applicants' claimed invention because Dierke uses a scaling matrix S for transform matrix T when Dierke's scaling step is performed, which is in contrast to Applicants' claimed invention, which uses a single coefficient from the collection of coefficients for the scaling step.

Dierke must first derive the scaling matrix S and then must scale the transform matrix T to create scaled matrix N. Dierke discloses that the scaled matrix N must have symmetric properties about the columns of matrix N in order to perform the butterfly operation, see Col. 4, lines 62-65, and therefore must take extreme care in the derivation of scaling matrix S. In other words, Dierke requires that columns 0-3 of scaled matrix N be equivalent to columns 7-4, respectively, except for sign. It can be seen from equation 2 of the instant application, however, that the scaled matrix of Applicants' invention need not contain the essential symmetric properties taught by Dierke. Applicants submit, therefore, that claim 1 patentably distinguishes over Dierke and is in condition for allowance.

Independent claims 36 and 47 set forth similar limitations as those discussed for claim 1 and, therefore, are patentable for at least the same reasons given above for independent claim 1.

Dependent claims 2-11, 37-46 and 48-49, which are dependent from independent claims 1, 36, and 47, respectively, are also rejected under 35 U.S.C. §102(b) as being unpatentable over Dierke. While Applicants do not acquiesce with the particular rejections to these dependent claims, it is believed that these rejections are now moot in view of the remarks made in connection with independent claims 1, 36 and 47. These dependent claims include all of the limitations of the base claims and any

intervening claims, and recite additional features which further distinguish these claims from the cited references. Therefore, dependent claims 2-11, 37-46 and 48-49 are also in condition for allowance.

In paragraph 4 on page 3 of the Office Action, claims 12-35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dierke.

Applicants respectfully traverse the rejection for the following reasons.

Not only does Dierke fail to disclose or fairly suggest Applicants' claimed invention for use in a data compression system or printer, for example, as set forth in independent claims 12 and 25, but Dierke teaches away from Applicants' claimed invention by necessitating the use of scaling matrix S when scaling transform matrix T into scaled matrix N. The symmetric properties of scaled matrix N being taught to be essential for performing the butterfly operation as discussed above. Applicants submit that claims 12 and 25 set forth limitations similar to those set forth in independent claims 1, 36, and 47 and are, therefore, patentable over Dierke for at least the same reasons given above for claims 1, 36, and 47.

Dependent claims 13-24 and 26-35, which are dependent from independent claims 12 and 25, are also rejected under 35 U.S.C. §103(a) as being unpatentable over Dierke. While Applicants do not acquiesce with any particular rejections to these dependent claims, it is believed that these rejections are now moot in view of the remarks made in connection with independent claims 12 and 25. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited

references. Therefore, dependent claims 13-24 and 26-35 are also allowable over Dierke.

In paragraph 5 on page 3 of the Office Action, claims 1-49 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,701,263 issued to Pineda in view of U.S. Patent 5,781,239 issued to Mattela et al (hereinafter Mattela).

The Applicants respectfully traverse the rejection for the following reasons.

Similarly to Dierke, Pineda does not use a single coefficient from the collection of coefficients for the scaling step, which is in direct contrast to the Applicants' claimed invention. Rather, Pineda teaches that each coefficient in the coefficient matrix is multiplied by the prescaling coefficient from equation (7) that corresponds to its position in the matrix. In other words, the scaling coefficient as taught by Pineda changes depending upon the position of the coefficient in the coefficient matrix. See Col. 6, lines 6-9. Furthermore, Pineda does not produce scaled coefficients that are approximated by sums of powers-of-2, as admitted by the Office Action, which is also in contrast to Applicants' claimed invention.

Mattela fails to remedy the deficiencies of Pineda because Mattela also does not disclose or fairly suggest the use of a single coefficient from the collection of coefficients for the scaling step. Rather, Mattela produces a scaling vector of size 10 which is required to scale the input coefficient matrix F_{uv}, where the particular value of the scaling parameter is selected from the scaling vector based upon the row/column position of the input coefficient matrix F_{uv}. See Col. 12, lines 16-49, in conjunction with FIG. 11.

The combination of Pineda and Mattela teaches away from Applicants' claimed invention by requiring an essential scaling of a coefficient matrix by a scaling vector or scaling matrix. The particular value used to scale each coefficient in the coefficient matrix depends, therefore, on its position in the coefficient matrix. In contrast, Applicants claimed invention uses a single scaling coefficient selected from a collection of the coefficients to perform the scaling, irregardless of its position within the coefficient matrix. Applicants submit, therefore, that claims 1, 12, 25, 36 and 47 patentably distinguish over the combination of Pineda and Mattela and are in condition for allowance.

Dependent claims 2-11, 13-24, 26-35, 37-46, and 48-49, which are dependent from independent claims 1, 12, 25, 36 and 47, are also rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Pineda and Mattela. While Applicants do not acquiesce with any particular rejections to these dependent claims, it is believed that these rejections are now moot in view of the remarks made in connection with independent claims 1, 12, 25, 36 and 47. These dependent claims include all of the limitations of the base claims and any intervening claims, and recite additional features which further distinguish these claims from the cited references. Therefore, dependent claims 2-11, 13-24, 26-35, 37-46, and 48-49 are also allowable over the combination of Pineda and Mattela.

CONCLUSION

In view of the amendments and reasons provided above, it is believed that all pending claims are in condition for allowance. The amendments clarify the patentable invention without adding new subject matter. Applicant respectfully requests favorable reconsideration and early allowance of all pending claims.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Attorney for Applicants, David W. Lynch, at 952-253-4104.

Respectfully submitted,

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Appendix A

47. (Amended) A data analysis system, comprising:

a memory for storing discrete cosine transform equations having been [are] formed by arranging the discrete cosine transform equations into at least one collection having at least two discrete cosine transform constants, scaling the discrete cosine transform equations in the at least one collection by dividing each of the discrete cosine transform [constant] constants in the collection by one of the discrete cosine transform constants from the at least one collection and representing each of the scaled discrete cosine transform constants with estimated scaled discrete cosine transform constants approximated by sums of powers-of-2; and

a transformer for applying the transform equations to perform a discrete cosine transform to decorrelate data into discrete cosine transform coefficients.